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PINE CYSTOID NEMATODE (MELOIDODERA FLORIDENSIS)

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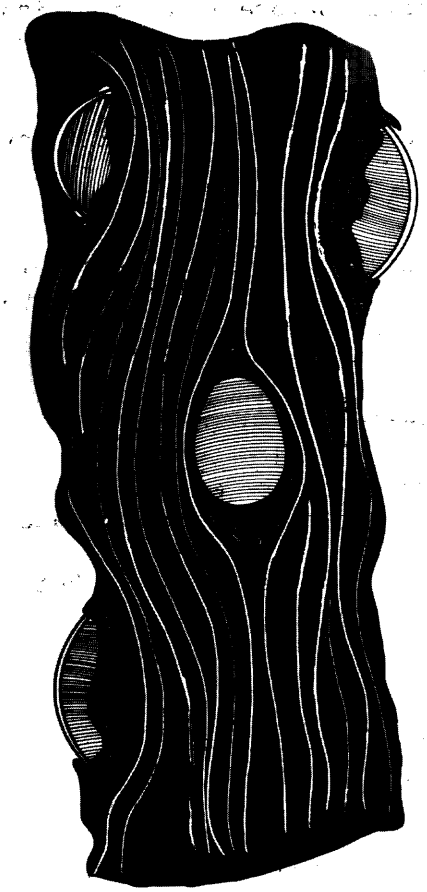
HISTORY: The pine cystoid nematode, Meloidodera floridensis Chitwood, Hannon, and Esser, 1956, was first detected in samples submitted from a pine nursery in Olustee, Florida, by Ralph L. King, Jr., in 1956.

GEOGRAPHIC DISTRIBUTION: This nematode occurs in Alabama, Florida, Georgia, New Jersey, and North Carolina. It is widely distributed in Florida, having been found in both cultivated and wild remote areas in 45 of 67 counties, and is probably an endemic species.



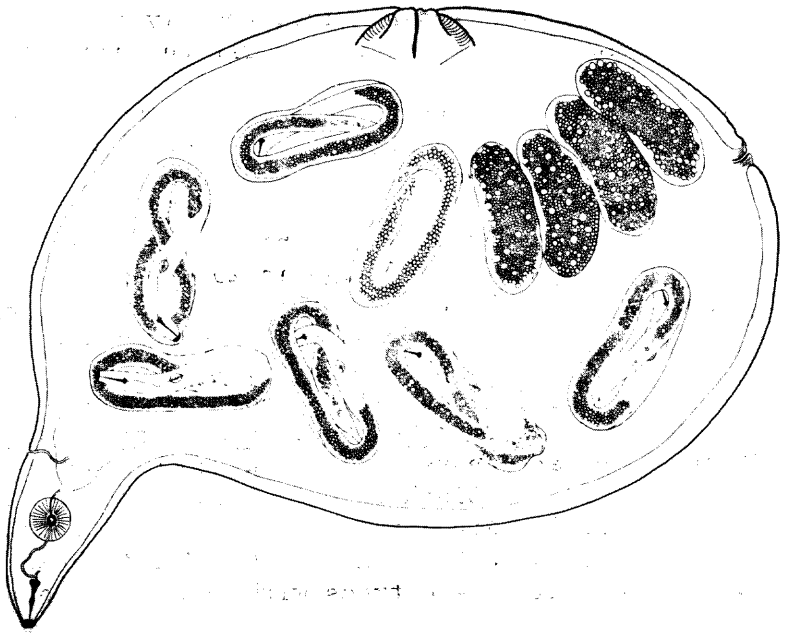


Fig. 1 (left). Females of M. floridensis protruding from a pine root.

Fig. 2 (above). A mature M. floridensis female.

HOST RANGE: Pine cystoid nematode has been found associated with the following plant genera and species: Amaryllis*, Annona*, Araucaria excelsa, Asparagus sprengeri, Bambusa, Bougainvillea, Brassica oleraceae, Buxus, Caladium bicolor, Camellia*, Carya, Cedrus*, Ceratiola ericoides, Citrus aurantium*, C. reticulata, C. sinensis, Cycas revoluta, Diospyros virginiana, Eremochloa ophiuroides*, Eriobotrya japonica, Gerbera jamesonii, Gladiolus, Hemerocallis, Hibiscus rosa-sinensis, Ilex glabra*, I. rotunda, Jasminum*, Juniperus conferta*, Lagerstroemia indica, Ligustrum, Livistona chinensis*, Magnolia, Meibomia, Morus, Musa paradisiaca*, Myrica cerifera, Nerium oleander*, Ophiopogon japonicum,

Paspalum notatum, Peperomia, Philodendron oxycardium, P. rubrum, Pinus clausa, P. echinata**, P. elliottii**, P. elliottii var. densa, P. glabra*, P. nigra, P. palustris**, P. rigida**, P. serotina**, P. strobus**, P. taeda*, P. virginiana**, Podocarpus macrophylla, Polystichum adiantiforme*, Prunus persica*, P. serotina, Psidium guajava*, Pyrus*, Quercus falcata, Q. incana, Q. laevis, Q. laurifolia, Q. virginiana*, Rhododendron indicum, Rhus copallia, R. toxicodendron, Rosa*, Sabal palmetto*, Sansevieria, Scindapsus aureus, Stenotaphrum secundatum, Vaccinium corymbosum, Vernonia ovalifolia, Viburnum odoratissimum, Zamia, and Zoysia.

SYMPTOMS: Seedlings of Pinus elliottii inoculated in the greenhouse failed to show symptoms for 2 years; after 2 years plants slowly began to yellow and became slightly stunted. Moderate root reduction occurred. Non-inoculated plants were green and healthy. The same host, in a nursery infestation, exhibits extensive root damage, stunting, and chlorosis.

DAMAGE: Nematodes invade lateral roots in the area behind the root tip, enter root wounds or root fissures, and migrate intercellularly before feeding. Giant cells form at the feeding site, usually in the cortex. Females enlarge during development and in some cases burst through the outer root layer (fig. 1).

LONGEVITY: Twenty larvae kept in 1 inch of water in a test tube were still moving after continuous refrigeration for 24 months. On 2 occasions during this test the water froze solid and thawed.

LIFE CYCLE: At 28/24C day/night temperatures, third stage female larvae developed in 18 days, fourth stage in 25 days, and adult females (fig. 2) in 45 days. Males develop with feeding, with 1 molt in the egg and 3 superimposed molts after hatching. Metamorphosis did not occur.

CONTROL: Soil infested with a complex of nematodes including Hoplolaimus galeatus, Helicotylenchus dihystera, Xiphinema americanum, and Meloidodera floridensis was treated with DD at 20 gal/acre or methyl bromide at 1 lb/ 100 square feet. Slash pine seedlings were planted in treated soil and adjacent untreated soil. After 5 years, pines in the treated soil were taller than those in the untreated. Methyl bromide-treated soil yielded taller trees but DD-treated soil showed trees with the best growth characteristics.

REFERENCES:

Ruehle, J. L. 1962. Histopathological studies of pine roots infected with lance and pine cystoid nematodes. Phytopathology 52(1):68-71.

_____ 1966. Nematodes parasitic on forest trees. I. Reproduction of ectoparasites on pines. Nematologica 12:443-447.

_____ 1969. Nematodes parasitic on forest trees. II. Reproduction of endoparasites on pines. Nematologica 15:76-80.

_____ and J. N. Sasser. 1962. The role of plant parasitic nematodes in stunting of pines in southern plantations. Phytopathology 52:56-68.

*Larvae from incubated roots. (Hosts without an asterisk indicate larvae found in soil only.)

**Observed in host root tissue.